Differential Gene Expression in Explanted Human Retinal Pigment Epithelial Cells 24-hours Post-Exposure to 532 nm, 3.0 ns Pulsed Laser Light and 1064 nm, 170 ps Pulsed Laser Light 12-hours Post-Exposure: Results Compendium

John W. Obringer Martin D. Johnson

Laser and Optics Research Center, Department of Physics

United States Air Force Academy Colorado Springs, Colorado 80840

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ABSTRACT

The use of laser light for military and commercial applications has sharply increased the likelihood of personnel exposure to laser light during operations. The increased potential for human exposure highlights the fact that there is paucity of basic science at the cell and molecular level concerning the effects of laser exposure of human cells. Current safety standards are largely extrapolations of exposure limits using a minimal visible lesion endpoint in the Rhesus monkey retinal model. A non-animal model for assessing laserlight damage to tissue, particularly human, is quite desirous for obvious scientific, political, and fiduciary reasons. We assessed the sublethal insult to human retinal pigment epithelial cells using a cadaver organ donor explant system for genes differentially expressed 12 and 24 hours post-exposure using gene expression microarray technology (gene chip). It appears that pulses of laser light are sensed and markedly alter gene expression. The two experiments presented herein are intended to add to the database of laser-tissue interaction at the molecular level using gene expression profiling as the assessment endpoint. This investigative approach also showcases a global methodology for characterizing environmental stressors on a living system via genetic profiling and hallmarks the use of human explants as an experimental model for assessing laser-induced bioeffects at the cell and molecular level. Additionally, we offer 3 conceptual cartoons outlining our vision for the future progress of laser bioeffects research, metabonomic risk assessment modeling and knowledge building from laser bioeffects data.

BACKGROUND

In the interest of brevity the reader is referred to USAFA-TR 2004-01 for the background.

MATERIALS AND METHODS

Explant procurement and processing: General overview

Tissues were received as a tissue donor gift through the Rocky Mountain Lion's Eye Bank who accomplishes all of the donor consent paperwork. Posterior globes of both eyes were harvested 8 hours post time of death and put into a 50 ml vial with approx. 25 ml of buffered saline. The tissue was transported directly to tissue culture lab where the vitreous humor and retina were mechanically removed. Then the RPE still attached to the sclera were cut into 3-5 mm square pieces. The pieces were then placed into 96 well microtiter plates (1 per well) with 150 microliters (ul) of the media (DME/F12 with 10% FBS plus antibiotics) and cultured at 37 degrees C in 5% CO2 until re-plated for

exposure. In a fresh 96 well plate the pieces were placed RPE side up centered in the well, in 50 ul media (just covers the explant) to be exposed. Explants were kept at 37 degrees until they were transported in a pre-warmed insulated box to the laser lab and exposed at room temperature in the plates on an X-Y translation stage one well at a time as quickly as possible to minimize temperature fluctuations then returned to the incubator after stereoscopic examination and the additional 100 ul of warm media. At the desired time post exposure, RPE was mechanically removed from the sclera and collected in microcentrifuge tubes, labeled and frozen at -65 degrees C. Samples were shipped frozen to the vendor with approx. 10 lbs of dry ice via overnight delivery. We accepted donors age 65 years or younger, either sex, with no mitigating ocular or retinal pathology such as glaucoma, diabetic retinopathy, retinitis pigmentosa, etc.

This report provides the results of two gene expression experiments. The first was a 532 nm, nanosecond pulse width exposure designated as N2. The second was a 1064 nm, picosecond pulse width exposure designated as P4.

Donor:

The RPE tissue donor for N2 was a 65 year old Caucasian, blue eyed, male that died of cancer. The RPE tissue donor for P4 was a 41 year old Caucasian, blue eyed, female that died of cancer. No ocular pathologies were noted.

Explant preparation: See USAFA-TR-2004-01

Laser: Equipment Used for N2

Laser (Nd:YAG)

Coherent Infinity XPO Laser

Power Meter

Scientech Power Meter model S310

Detector Head

Scientech model PHDX50

Shutter

nmLaser model LS055S3W8

Shutter Controller

nmLaser model CX2450

Velmex XY Stage

model NF90-2

Laser: Equipment Used for P4

Laser (Nd:YAG)

EKSPLA, model SL312T, serial number 017

Power Meter Detector Head Molectron OM4001 power meter, serial number 136C J50 Detector Head, with diffuser, serial number 1518B

Shutter

nmLaser model LS055S3W8

Shutter Controller

nmLaser model CX2450

Velmex XY Stage

model NF90-2

In both exposures the pulse energy was determined by placing a power meter on the x-y translation stage (the site of target exposure) and dividing the measured average power by

the pulse repetition rate. This method was considered adequate since pulse-to-pulse energy typically varied less than 10%. The beam profile is a "top hat" with less than 5% variation across the wave front.

Laser-light exposure:

For procedures see USAFA-TR-2004-01. In the table below are the exposure parameters for the experiments reported herein.

Treatment	N2	P4
Wavelength (nm)	532	1064
Average Power (mW)	508	1150
Pulse Energy (mJ)	50.8 ± 1.2	115 ± 5
Pulse Length (FWHM)	3.0 ns	170 ps
Total Incident Energy (mJ)	3251	3220
Peak Power (W)	1.69×10^7	6.76×10^8
Fluence (mJ/cm ²)	108	244
Exposure Time (sec)	6.4	2.8
Laser Repetition Rate (Hz)	10	10
Beam Diameter (1/e²)	6 mm	6 mm
Irradiance (kW/m²)	18.0	40.7

Total incident energy (TIE) is defined as the amount of laser-light energy that was delivered to the 6 mm well containing the RPE explants. Abbreviations: nm-nanometer; m-meter, mm-millimeter, ns-nanosecond; mJ-milliJoule; mW-milliWatt; FWHM-Full Width Half Max; Hz-Hertz; sec-second; W-watt; e-natural log.

Laser exposure of Human RPE Explants

The Nd:YAG laser light exposure regimen was based on empirical data (not shown) that established cell viability after a range of laser exposures. The exposure described above for treatment N2 was calculated to be 1.8 k J/m² which is about 10% of the MVL value and approximately 65% above the MPE for the pulse width and wavelength considered (Sliney and Wolbarsht, 1980 and ANZI Z136.1-2000 Table 5a). The exposure described above for treatment P4 was calculated to be 4.1 k J/m² which is about 16% of the MVL value and approximately 20% above the MPE for the pulse width and wavelength considered (Sliney and Wolbarsht, 1980 and ANZI Z136.1-2000 Table 5a)

In experiment N2 the cells were exposed to either 1) sham exposed to no laser-light (beam blocked upstream), or 2) 64 pulses of 532 nm visible laser-light. Each pulse containing 50.8 mJ \pm 1.2 mJ (on average) of energy was delivered to a microtiter plate well 6 mm in diameter containing 50 microliters of medium. In experiment P4 the cells were exposed to either 1) sham exposed to no laser-light (beam blocked upstream), or 2) 28 pulses of 1064 nm visible laser-light. Each pulse containing 115.5 mJ \pm 5 mJ (on

average) of energy was delivered to a microtiter plate well 6 mm in diameter containing 50 microliters of medium. See Figure 2 in USAFA-TR-2004-01 for a general overview of the experimental procedures.

Exposed RPE collection

Sample N2 was harvested 24 hours post-exposure for gene chip analysis; while sample P4 was harvested at 12 hours post-exposure. A "C" beginning the sample designation (i.e. CP4 or CN2) indicates the control sample for comparison. The "HX" designation indicates the use of human explanted tissue as the experimental model. See USAFA-TR-2004-01 for further procedural details.

Oligonucleotide Microarray Description Protocol and Analysis:

See USAFA-TR-2004-01.

For a complete listing of sequence sources and human array design the reader should visit Affymetrix's website at www.affymetrix.com, Technical Note: Array Design for the GeneChip Human Genome U133 Set.

RESULTS

The results (Appendix A and B) of a gene expression microarray are expressed in fold change in expression for one gene in the control versus the experimental samples. For example, if gene YFG is expressed four times greater in the treated cells than in the sham exposed controls, it would show a fold change of positive four (4) in Appendix A that functionally means that gene YFG mRNA was found in 4 times greater concentration in the treated cells than in the controls. Thus, we conclude that the treatment induced the genetic expression of gene YFG four times greater in the experimentally treated cells than in the shame treated cells, presumably in response as the biological effect of the treatment. Conversely, if the YFG mRNA is 4 fold less in the experimental sample that in the control then a value of -4.0 fold is calculated. The assignment of the plus or minus designations on Appendix A is a function of the algorithm in the software used to calculate the fold change. In the context of understanding the significance of fold change or fold induction of a gene, the analysis software calculates a 95% confidence level of fold change for each experiment. For this set of hybridizations labeled N2 and P4 the confidence was calculated to be +/-1.2 for both.

Appendices A and B presents the most pertinent genes (at or above the absolute value for significance) listed in rank ordered by absolute fold change minus to plus at or above the significance value. To help clarify the interpretation of this appendix the following heading explanations are offered. Probe set: the listed name of the gene being probed. Control probe sets have been deleted from the data set in Appendix A. All signals in Appendix A have passed the quality control standards established by the manufacturer. The internal controls are used by Affymetrix to calibrate the array and as quality control

elements. Control signal: the balanced (adjusted for background) signal strength for the control sample. Exptl Signal: the balanced (adjusted for background) signal strength for the experimental sample. Control vs Exptl Fold Change: the fold change based on the comparative signal strength of the control RPE sample as compared to the experimental. This is the fold change value that is used as the endpoint value, and for further analysis in the interpretation of the differential gene expression microarray results for the designated genetic elements listed under "Probe set." Description: a brief description of the gene or EST that is represented in the probe set. The appendix obviously contains only a portion of the total number of elements probed and only those whose absolute fold change was at least at the minimum significance level or higher that has been calculated to be at or above the statistical significance of 95%.

For experiment N2 a quick survey of the Fold Change (Figure 1), Variable Bin Histogram (Figure 2) and Differential Expression Scatter Plot (Figure 3) (internal controls are not in the graph data set) and Appendix A yields the observation that RPE mRNA was above 1.2 absolute fold change in 146 of the approximately 22, 000 (approximately 0.7%) probe elements on the GEM. Of those 77 (0.4% of the total possible elements and 52.7% of the significantly expressed elements) were up-regulated. The number of genes whose expression was down regulated was markedly less. 68 (0.3% of the total possible elements and 46.6% of the significantly expressed elements) genes were down-regulated at or above significant levels. In summary, the number of significant changes in gene expression was approximately equal in the up-regulated direction versus down-regulated direction, but the greatest magnitude of change for single genes was up-regulation with over two times greater fold change.

For experiment P4 a quick survey of the Differential Expression Scatter Plot (Figure 4) (internal controls are not in the graph data set) and Appendix B yields the observation that RPE mRNA was above 1.2 absolute fold change in 408 of the approximately 22, 000 (approximately 1.9%) probe elements on the GEM. Of those 324 (1.5% of the total possible elements and 79.4% of the significantly expressed elements) were up-regulated. The number of genes whose expression was down regulated was markedly less. 83 (0.4% of the total possible elements and 20.3% of the significantly expressed elements) genes were down-regulated at or above significant levels. In summary, the greatest number of significant changes in gene expression was in the up-regulated direction (nearly 4 times), and the greatest magnitude of change for single genes (over 2 times) was also up-regulation.

DISCUSSION

Selected genes and ESTs from Appendices A and B can be reviewed as to the physiological function and/or biological marker for which they are known whenever possible. Also note that the appendices contain ESTs that were differentially regulated by the cells post laser exposure. As of the date of the experimental analysis, the functions of the genes related to the above ESTs were not known. But recent updates of the NCBI genomic database, several ESTs in the appendices have been assigned

genetic/physiologic functions. However, other EST's that were differentially regulated functions remain unknown thus remain fertile ground for future exploration and analysis. Gene functions can easily be located through a PubMed query in the NCBI searchable database format found in the appendices.

These two experimental data sets are offered as a contribution to the continuing efforts in understanding the response of RPE to the exposure of high energy pulsed laser-light exposure using gene expression profiling 12 hours and 24 hours post-exposure. In the multi-dimensional hyper-volume of laser settings versus various tissues' response and time of response post-exposure, these can provide insights at specific matrix data points to possible perturbation to cellular physiology to include aspects of damage, repair and decreased/absent/rescued function.

Closing

As a closing comment we offer the following observation: These are the last gene expression profile experiments using Affymetrix GeneChip technology done in the Laser and Optics Research Center, Department of Physics, United States Air Force Academy. We highly recommend that this type of work, started here, be continued to aid in understanding the effect of laser-light exposure on affected human tissue. This use of living human cadaver donor tissue marks a major step forward toward assessing the cellular perturbation to be expected in the human organism and should be strongly considered as an experimental model until such time as the tissue microarray and organotypic model technologies more closely approximate the in vivo human response. We also suggest the employment of various statistical modeling techniques such as Taguchi's to establish the relevant orthogonal contrasts in the multi-dimensional hypervolume of laser settings versus biological response endpoints to rationally define the pertinent experimental data points to appropriately model laser-tissue interaction. In the context of more in depth analysis of the gene expression data, numerous higher order software platforms offer advance analyses, some employing artificial intelligence capabilities. As a closing thought we are attaching our concepts of future laser bioeffects research directions (Figure 5), a metabonomic risk assessment model of laser tissue interaction (Figure 6), and some suggestions for the transition to knowledge building/modeling from data collection (Figure 7) in laser bioeffects research.



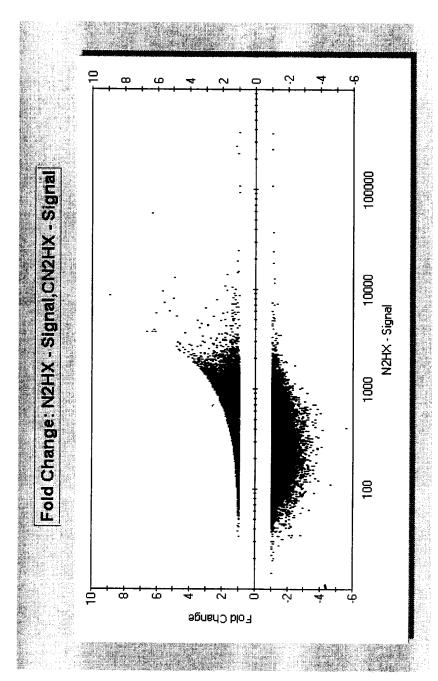


Figure 2.

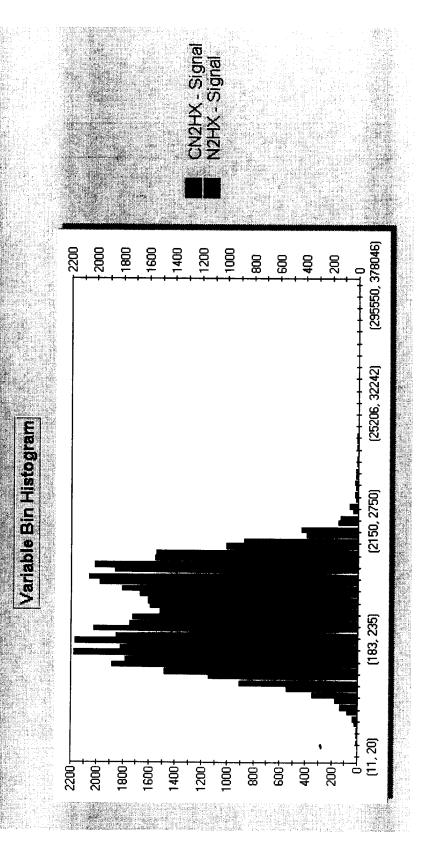
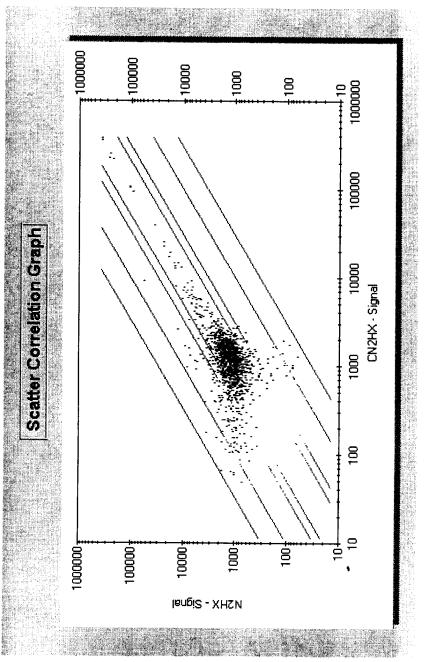


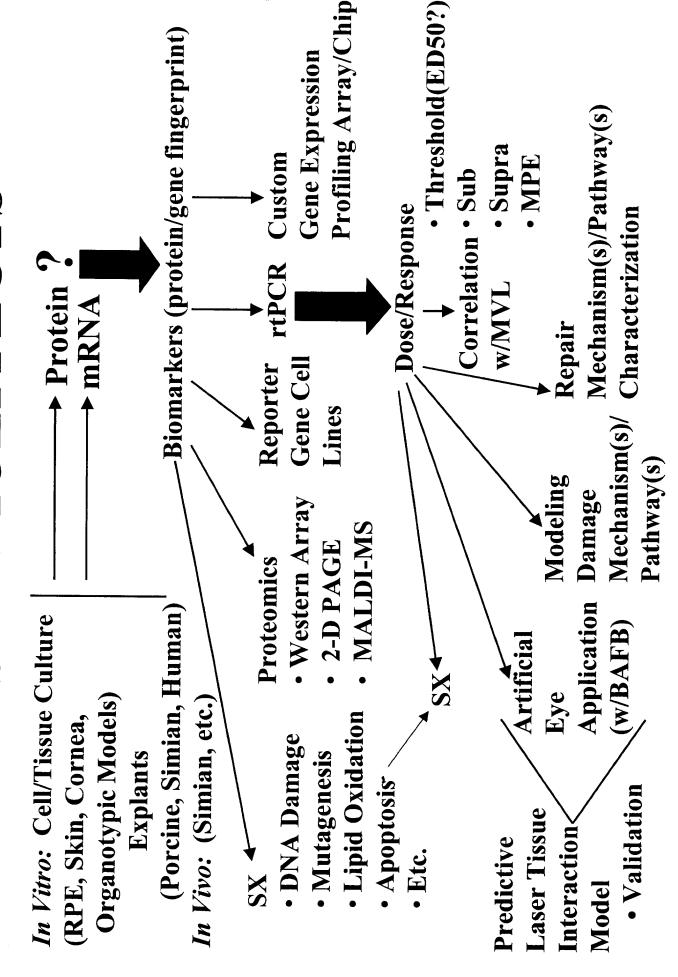
Figure 3.



Fold Change: P4HX12 - Signal CP4HX12 - Signal 10000 P4HX12 - Signal 1000 Fold Change 5

Figure 4.

LASER BIOEFFECTS



METABONOMIC RISK ASSESSMENT

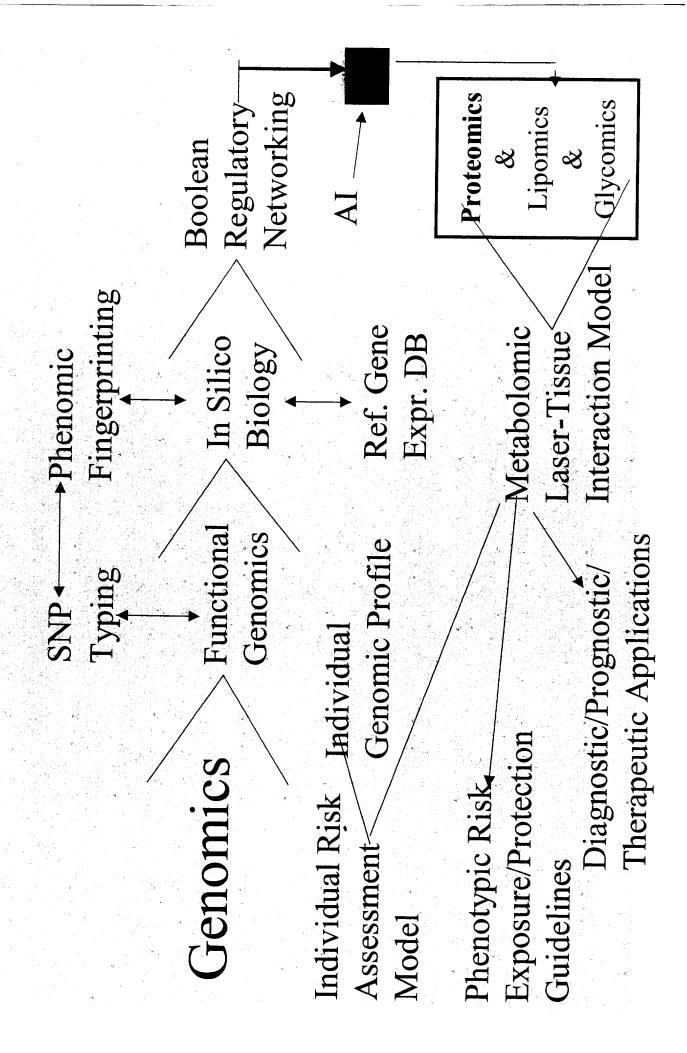


Figure 6.

KNOWLEDGE BUILDING

(Transition from data collection)

- Statistical Design
- Multi-Dimensional Hyper-Volume (laser settings)
- Orthogonal Contrasts Drive Experimental Design
- Biological Endpoints
- **Bioinformatics**
- Integrative Platform (data mining)
- Central Repository
- Biomarker Discovery/Validation
- Retrospective Analysis-MVL
- Clinical data correlated to histo/cell/molecular data
- Exposures/Metabolic Homology/Bridging Experiments
- Collaboration=Max. Efficiency/Integration/Holism

2 Description ge	Consensus includes gb:Al814728 /FEA=EST /DB_XREF=gi:8362195 /DB_XREF=est:hn26h0.x1 /CI consensus includes gb:Al65142 /FEA=EST /DB_XREF=gi:8352195 /DB_XREF=est:hn26h0.x1 /CI gb:AF115403.1 /DEF=Homo sapiens Ets transcription factor ESE-2b mRNA, complete cds. /FEA=mConsensus includes gb:Al65242 /FEA=EST /DB_XREF=gi:867343 /DB_XREF=est:AV652420 /CL1 Consensus includes gb:U6461 /DEF=Human poly(A)-binding protein processed pseudogens 3/FE consensus includes gb:U6461 /DEF=Human poly(A)-binding protein processed pseudogens 3/FE consensus includes gb:U6461 /DEF=Human poly(A)-binding protein processed pseudogens 3/FE gb:NM_006013.2 /DEF=Homo sapiens way 3 oncogene (VAV3), mRNA_FEA=mRNA /GEN=PRAY 9/PED=CONSENSUS in CEN=MONA /GEN=PRA /PSQ-BA /FEA=EST /DB_XREF=gi:1083890 /DB_XREF=est:4072944 /CI CONSENSUS in CONS
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N2HX Signal	325.2 989 822.4 980.6 527.9 1033.6 1023.7 837.8 714.1 519.2 1268.9 1440.9 962.6 699.7 970.3 629.3 1258 2176.6 971.5 1920 1025.8 3401.8 1556.6 2181.2 612.4 845.8 1110.2
CN2HX Signal	922.1 2715.5 2057.1 2212.3 1145.2 2178.8 2276.8 1971.2 1584.6 1343.5 932.7 2260.9 2545.9 1636.1 1613.4 1040.5 2056.3 3438.9 - 1527.2 3007.9 1566.8 5209.2 2283 1673.7 2283 1673.7 2283 1213.7 1580.8 2728.4
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gb:NM_021943.1 /DEF=Homo sapiens hypothetical protein FLJ13222 (FLJ13222) mRNA /FFA=mP	gb:AF311940.1 /DEF=Homo saplens pregnancy-associated plasma preproprotein-A2 mRNA, comp	go.nm. U14765.17/DET=Homo sapiens translocase of outer mitochondrial membrane 20 (yeast) hor otherway to the contract of the c	Consensus includes ab: AB044542 4 /AEEELL	db:\\\ 000982.1 /DEE=Homo earline ribosomal action of the KIAA0642 protein, partial cds.	Consensus includes ab:N57784 /FEA-ECT /nb VDET	Cluster Incl. Al783924-tr30e11 v1 Home sanions on 1 / 1 / 1 / 1 / 1 / 1 / 1 / 1 / 1 / 1	Consensus includes ah-∆W613387 /EEA-EET Includes voer	Consensus inclindes ab: A1448360 /FEA-ES1 / UB_XREF=g1:/3185/3 / UB_XREF=est:hh71e04.x1 / C	Consensus includes ab: Albahata /rea-est // DB_XREF=gi:4083556 // DB_XREF=est:4p50c06.x1 /CL	gb:NM 001003.1 /DEFEHomo capiene ribosomal motals 128/4892 /DB_XREF=est:0e29d06.s1 /C	gb:NM 017766.1 /DEF=Homo saniens hypothetical protein; large, FT (KFLFT), mKNA, /FEA=mRNA /C	Consensus includes ab: AF222691 1 // I/FE=Home consensus includes ab: AF222691 1 // I/FEA=mR	Consensus includes ab: AW474158 /FFA=EST /DB YDEE=YA4455 /JEA	Consensus includes ab AW974816 /FEA=EST /NB VBEET-1104004 /NB /NEF=est:xy11f01.x1 /Cl	gb:NM 024430.1 (DEF=Homo capiene proline coring through the coring through through the coring through the co	db:NM 005697.2 /DEF=Homo capiene enception of the contracting protein 2 (db:NM 000353.1 (DEFEHOMS earline turnsing amin. f. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	Consensus includes ab AR011007 1 Increme aminotransierase (TAT), nuclear gene encoding mit	db:BC002513.1 /DEF=Homo canions on bancotto translation in the control of the con	ab:BC004239 1 /DEFEHomo earliene immined for the property of t	Consensus includes ab: AF007156 1 (DEE-Lows continued) and a first of the Consensus includes ab: AF007156 1 (DEE-Lows continued)	Consensus includes ab: Al 021937 / DEFEH was DNA common from the consensus includes ab: Al 021937 / DEFEH was DNA common from the consensus includes ab: Al 021937 / DEFEH was DNA common from the consensus includes ab: Al 021937 / DEFEH was DNA common from the consensus includes ab: Al 021937 / DEFEH was DNA common from the consensus includes ab: Al 021937 / DEFEH was DNA common from the consensus includes ab: Al 021937 / DEFEH was DNA common from the consensus includes ab: Al 021937 / DEFEH was DNA common from the consensus includes ab: Al 021937 / DEFEH was DNA common from the consensus includes ab: Al 021937 / DEFEH was DNA common from the consensus includes ab: Al 021937 / DEFEH was DNA common from the consensus includes ab: Al 021937 / DEFEH was DNA common from the consensus includes ab: Al 021937 / DEFEH was DNA common from the consensus includes ab: Al 021937 / DEFEH was DNA common from the consensus includes ab: Al 021937 / DEFEH was DNA common from the consensus includes ab: Al 021937 / DEFEH was DNA common from the consensus includes ab: Al 021937 / DEFEH was DNA common from the consensus includes ab: Al 021937 / DEFEH was DNA common from the consensus includes ab: Al 021937 / DEFEH was DNA common from the consensus includes ab: Al 021937 / DEFEH was DNA common from the consensus includes ab: Al 021937 / DEFEH was DNA common from the consensus absolute ab: Al 021937 / DEFEH was DNA common from the consensus absolute ab: Al 021937 / DEFEH was DNA consensus absolute ab: Al 021937 / DEFEH was DNA consensus absolute ab: Al 021937 / DEFEH was DNA consensus absolute ab: Al 021937 / DEFEH was DNA consensus absolute ab: Al 021937 / DEFEH was DNA consensus absolute ab: Al 021937 / DEFEH was DNA consensus absolute ab: Al 021937 / DEFEH was DNA consensus absolute ab: Al 021937 / DEFEH was DNA consensus absolute ab: Al 021937 / DEFEH was DNA consensus absolute ab: Al 021937 / DNA consensus ab: Al 02	Consensus includes ob. Al1444530 /EEA-EET includes ob. Al1444530 /EEA-EEA-EET includes ob. Al1444530 /EEA-EEA-EEA-EEA-EEA-EEA-EEA-EEA-EEA-EEA	Consensus includes ab: AK021533 1 (DEFE-Home serions of Maria 11 11 11 11 11 11 11 11 11 11 11 11 11	gb:D29640.1 /DEF=Human mRNA for KIA Annet constitution in the cons	Consensus includes on RE551219 (EEA-ECT IND VOLT STACK)	gb:NM 014478.1 /DEF=Homo sanions calcitonin conductions and calcitonin conductions.	Consensus includes ab: Algorda refales and the vertile and the vertile and the component protein	Cluster Incl. X60592-Himan Charles Charles 17 Jb AKEF=91:3365891 / DB XREF=est:tj14b09.x1 / CLC	gb:NM 002993.1 (DEF=Homo sanione email industrial control in the control of the c	Consensus includes ah-1132169 (DEE-Human and 12 Later 12	gb:AB037703.1 /DEF=Homo sanians SID1-delts mbNA for SMA11-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	Consensus includes gb:X14362.1 /DEF=Human CR1 mRNA for C3bC4b receptor secreted form. /FE
4.	-1.4 -1.3			-1.36	-1.36	-1.35	-1.34	-1.33	-1.33	-1.32	-1.32	-1.31	-1.3	-1.3	-1.29	-1.29	-1.28	-1.27	-1.26	-1.26	-1.25	-1.25	-1.25	-1.24	-1.23	-1.23	-1.23	-1.23	-1.23	-1.22	-1.22	-1.21	-1.2
1358.6	1499	923.7	2006.7	1155.6	1458.4	2838.1	943.1	930.3	1780.5	1974.5	2204.7	7096.3	2462.1	3629.1	922.6	1781.5	2235.8	1046.8	901.9	1412.7	1111.4	1548.7	2076.8	910	1269.9	1417.9	1448.8	2397.5	2635.7	932.4	2583.4	1064.1	1326.5
1899	2076.6	1272	2753.3	1571.5	1986.5	3832.8	1261.3	1237.6	2376.8	2612.7	2899.9	9297	3189.9	4701.1	1194.6	2299.2	2861.6	1326.9	1136.1	1777.1	1388.9	1932.6	2606	1127.2	1563.4	1740.1	1780.4	2957.5	3243.7	1133.4	3147.8	1285	1593.5
218020_s_at	200662_s_at	208020_s_at	212261_at	200012_x_at	222370_x_at	56197_at	217497_at	213226_at	213798_s_at	200763_s_at	220015_at	216187_x_at	215019_x_at	222329_x_at	219938_s_at	218143_s_at	206916_x_at	214034_at	201143_s_at	210927_x_at	215478_at	217406_at	215607_x_at	214869_x_at	210840_s_at	214135_at	203899_s_at	213612_x_at	35150_at	206336_at	216993_s_at	211115_x_at	217484_at

Consensus Includes gb:BG029530 /FEA=EST /DB_XREF=gi:12418626 /DB_XREF=est:602297090F1 Cluster Incl. AB020648:Homo sapiens mRNA for KIAA0841 protein, partial cds /cds=(0,1925) /gb=A Consensus includes gb:X68485.1 /DEF=H.sapiens mRNA for A1 adenosine receptor. /FEA=mRNA	gb:Nmou4zz3.17DEF=Homo sapiens ubiquitin-conjugating enzyme E2L 6 (UBE2L6), mRNA. /FEA gb:NM_013235.1 /DEF=Homo sapiens putative ribonuclease III (RNASE3L), mRNA. /FEA=mRNA /G Consensus includes gb:BE962749 /FEA=EST /DB_XREF=gi:11765968 /DB_XREF=est:601656143R1 gb:NM_018004.1 /DEF=Homo sapiens hypothetical protein FLJ10134 (FLJ10134), mRNA. /FEA=mR	gb:\nm_U13329.1 /DEF=Homo sapiens GC-rich sequence DNA-binding factor candidate (GCFC), ml Consensus includes gb:AL137312.1 /DEF=Homo sapiens mRNA; cDNA DKFZp761K23121 (from clude) gb:\NM_020117.1 /DEF=Homo sapiens hypothetical protein FLJ10595 (FLJ10595), mRNA. /FEA=mR Consensus includes ab:\AK023757 1 /DEF=Homo	gb:NM_000922.1 /DEF=Homo sapiens phosphodiesterase 3B, cGMP-inhibited (PDE3B), mRNA. /FE gb:NM_001530.1 /DEF=Homo sapiens hypoxia-inducible factor 1, alpha subunit (basic helix-loop-homo sapiens hypoxia-inducible factor 1, alpha subunit (basic helix-loop-homo sapiens hypoxia-inducible factor 1, alpha subunit (basic helix-loop-homo sapiens professions)	gb:NM_000923.1 /DEF=Homo sapiens phosphodiesterase 4C, cAMP-specific (dunce (Drosophila)-I Consensus includes gb:AK023837.1 /DEF=Homo sapiens cDNA FLJ13775 fis, clone PLACE400036	gb:NM_024305.1 /DEF=Homo sapiens hypothetical protein MGC4278 (MGC4278), mRNA. /FEA=mR Consensus includes gb:N32526 /FEA=EST /DB_XREF=gl:1152925 /DB_XREF=est:yy11f04.s1 /CLOf	Consensus includes gb:AK024958.1 /DEF=Homo sapiens cDNA: FLJ21305 fis, clone COL02124. /Fi gb:NM_024881.1 /DEF=Homo sapiens hypothetical protein FLJ14251 (FLJ14251), mRNA. /FEA=mR gb:NM_017627.1 /DEF=Homo sapiens hypothetical protein El 190030 /El 190030	Consensus includes gb: Al688418 /FEA=EST /DB_XREF=gi: 4899712 /DB_XREF=est: wc94h03.x1 /Cl Cluster Incl. AB015718: Homo sapiens lok mRNA for protein kinase, complete cds /cds=(50,2956) /c	Consensus includes gb::D0249303 /rEA=EST /DB_XREF=gi:12759381 /DB_XREF=est:602319636F1 Consensus includes gb::AB023215.1 /DEF=Homo sapiens mRNA for KIAA0998 protein, partial cds. gb::AF261137.1 /DEF=Homo sapiens HT031 mRNA, complete cds. /FEA=mRNA /PROD=HT031 /DB	Consensus includes gb:AK023783.1 /DEF=Homo sapiens cDNA FLJ13721 fis, clone PLACE200045 Consensus includes gb:AA749101 /FEA=EST /DB_XREF=gi:2789059 /DB_XREF=est:ny11d02.s1 /C	Consensus includes gb:BE046461 /FEA=EST /DB_XREF=gi:8363514 /DB_XREF=est:hn47g05.x2 /C	gb:NM_031221.1 /DEF=Homo sapiens hypothetical protein FKSG63 (FKSG63), mRNA. /FEA=mRNA ab:BC006325.1 /DEF=Homo sapiens G-2 and S-phase oxymetrical 4 along the protein control of the p	Consensus includes gb:\M_005395.1 /DEF=Homo sapiens postmelotic segregation increased 2-lik Cluster Incl. W07773:zb03g04.r1 Homo sapiens cDNA, 5 end /clone=IMAGE-301014 /clone_end=5
121	1.22 1.22 1.22 1.22 1.22 1.22	1.22	1.25	1.27 1.29	<u> </u>	1.37	1.35	1.36	1.36	1.39	4.1 4.1	1.42
1685.1 3560.4 1462.8	1269.9 1388.4 1426.8	4515.3 2504.9 1512.8	2110.3 2154.2 5656.3	9990	1925.3 2928.8 5021.2	8986.1 2466.5	899.9 1337.6 2096.6	1714.5	2557.5 7138 4958.8	925 4858.3	8319.7 2862.8	1561.5 5368.6
2019.8 4267.1 1209.3	1044.9 1136.1 1165.6	3715.8 2031.2 1206.8	1688.9 1704 4464.7	7879.1	1469.7 2235.8 3831.3	6875.1 1864.1	666.3 - 991.1 1552	1262.1	1875.3 5238.3 3601.5	666.4 3502.6	5959.6 2034.3	1096.5 3787.7
203297_s_at 36888_at 216220_s_at 201649_at	218269_at 204517_at 219410_at	215383_x_at 217810_x_at 216159_s_at	208591_s_at 200989_at 201404_x_at	206792_x_at 212208_at	220352_x_at 212607_at 215588_x_at	220796_x_at 207783_x_at	213030_s_at 40420_at 213507_s_at	214672_at 209927_s_at	214022_s_at 121_at	215303_at 215179_x_at	208120_x_at 211040_x_at	214473_x_at 55705_at

Consensus includes gb:AK024789.1 /DEF=Homo sapiens cDNA: FLJ21136 fis, clone CAS07469. /FE gb:BC001407.1 /DEF=Homo sapiens, Similar to cytochrome c-like antigen, clone MGC:2960, mRNA gb:AB007892.1 /DEF=Homo sapiens KIAA0432 mRNA, complete cds. /FEA=mRNA /GEN=KIAA0432 Consensus includes gb:MZ2976.1 /DEF=Human cytochrome b5 mRNA, 3 end. /FEA=mRNA /GEN=C gb:NM_016056.1 /DEF=Homo sapiens CG1-119 protein (LOC51643). mRNA. /FEA=mRNA /GEN=LOC Consensus includes ch.Al 04028.1 /DEF=Homo sapiens CG1-100056.1	gb:NM_022335.1 /DEF=Homo sapiens hypothetical protein PRO2849 (PRO2849), mRNA. /FEA=mRN gb:U20489.1 /DEF=Human glomerular epithelial protein 1 (GLEPP1) mRNA, complete cds. /FEA=mR db:NM_007234.2 /DEF=Homo sapiens dimedia 2 / - 20. / 2	gb:NM_005926.1 /DEF=Homo sapiens uynacun 3 (pzz/ (DCTN3), transcript variant 1, mRNA. /FEA=n gb:NM_005926.1 /DEF=Homo sapiens microfibrillar-associated protein 1 (MFAP1), mRNA. /FEA=mR Consensus includes gb:AL581768 /FEA=EST /DB_XREF=gi:12949093 /DB_XREF=est:AL581768 /CL	Consensus includes gb:X58851 /DEF=Human MLC1emb gene for embryonic myosin alkaline light c Consensus includes gb:BF448041 /FEA=EST /DB_XREF=gi:11513102 /DB_XREF=est:7q97f09.x1 /C	Consensus includes gb:BG498776 /FEA=EST /DB_XREF=gi:13460293 /DB_XREF=est:602544416F1	gb:AF195514.1 /DEF=Homo sapiens YOS4-2 ATPase (VPS42) mRNA, complete cds. /FEA=mRNA /G	gb:NM_014928.1 /DEF=Homo sapiens KIAA1046 protein (KIAA1046), mRNA. /FEA=mRNA /GEN=KIA gb:NM_020114.1 /DEF=Homo sapiens acrosomal vesicle protein 1 (ACRV1). transcrint variant o_mp	gb:NM_031207.1 /DEF=Homo saplens hypothetical protein HT036 (HT036), mRNA_FEA=CD3 /GEN gb:NM_005502.1 /DEF=Homo saplens ATP-hinding cascate sub-family A A PC /	gb:AF154847.1 /DEF=Homo sapiens 33 kDa Vamp-associated protein (VAMP) mRNA, complete cds ob:AF069510.1 /DFF=Homo sapiens ending biographic controls.	gb:NM_001918.1 /DEF=Homo sapiens dihydrolipoamide branched chain transacylase (E2 compone	gb:NM_017618.1 /DEF=Homo sapiens hypothetical protein FLJ20006 (FLJ20006), mRNA /FEA=mRNA /G	gb:AF130054.1 /DEF=Homo sapiens clone FLB4816 PRO1252 mRNA, complete cds. /FEA=mRNA /P gb:NM 014183.1 /DFF=Homo sapiens HSDC162 models (HSDC162)	gb:NM_018097.1 /DEF=Homo sapiens hypothetical protein FLJ10460 (FLJ10460), mRNA /FEA=mR	gb:NM_024906.1 /DEF=Homo sapiens hypothetical protein FLJ21032 (FLJ21032), mRNA. /FEA=mR Consensus includes ab. At 127708 /DEF=Homory DAY	Consensus includes gb:AL524262 /FEA=EST /DB XRFF=qi:13787755 /DB YBEE=	gb:D89377.1 /DEF=Homo sapiens mRNA for MSX-2, complete cds. /FEA=mRNA /PROD=MSX-2 /DB	gb:AF087847.1 /DEF=Homo sapiens GABA-A receptor-associated protein like 1 (GABARAPL1) mR	Consensus includes gb:AW276646 /FEA=EST /DB_XREF=gi:6663676 /DB_XREF=est:xr17f12.x1 /Ct
1.42 1.43 1.44 1.44 1.46	1.48	1.52	1.54 1.55		1.59	1.59 1.6	1.62 1.66	1.72	1.74	1.76	1.8 1.85	1.9	1.94	7	2.01	2.08	2.09
7190 5675.8 10405.8 1693.4 2145.1 6154.8	4313.7 4012.4 2091.5	3412.4	1706.5 1817.6 2536	2899.4 1648.6	1449.5	1876.3	1427.6 1002.4	1930.1 3496	14071.5 2182.3	5918.3	4246.9 3279.7	4959.7	10811.6 1516.9	5764.6	1500	1436.2	2086
5050.3 3960.6 7271.8 1179.8 1491.5	2925.9 2704.1 1387.3	1483.7 2227.4	1180.3 1634.7	1858.2 1046.6	909	1146.1	881.7 603.2	1121.1 -2020.1	8100.3 1246.3	3369.8	1771.8	2615.6	783.7	2887.1	746.5	690.Z	6.766
214715_x_at 210686_x_at 209057_x_at 215726_s_at 219206_x_at 21926_x_at	206936_x_at 211600_at 204246_s_at	203406_at 212639_x_at 216054_v_at	212735_at 201922_at	212284_x_at 206940_s_at	218171_at	207990_x_at	203504_s_at	208780_x_at 210739_x_at	205370_x_at 201575_at	208246_x_at 211452_x_at	217918_at	220071_x_at	213382_at	213835_x_at	210319_x_at	213036 × 24	Z 13930_X_d1

Cluster Incl. R61374:yh15e02.s1 Homo sapiens cDNA, 3 end /clone=IMAGE-37665 /clone_end=3 /c Consensus includes gb:L13779.1 /DEF=Homo saplens (clone H16) sperm surface protein PH-20 m gb:AF083420.1 /DEF=Homo sapiens brain-specific STE20-like protein kinase 3 (STK3) mRNA, comp gb:NM_003204.1 /DEF=Homo sapiens nuclear factor (erythrold-derived 2)-like 1 (NFE2L1), mRNA. Consensus includes gb:AA320764 /FEA=EST /DB_XREF=gi:1973113 /DB_XREF=est:EST23183 /UG Cluster Incl. X16135:Human mRNA for novel heterogeneous nuclear RNP protein, L protein /cds=c/gb:NM_000998.1 /DEF=Homo sapiens ribosomal protein L37a (RPL37A), mRNA. /FEA=mRNA /GEN gb:BC002456.1 /DEF=Homo sapiens, voltage-dependent anion channel 3, clone MGC:1966, mRNA, gb:NM_016451.1 /DEF=Homo sapiens coatomer protein complex, subunit beta (COPB), mRNA. /FE Consensus includes gb:BE857772 /FEA=EST /DB_XREF=gi:10372131 /DB_XREF=est:7462a11.x1 //
2.12 2.34 2.57 2.57 3.06 3.43 4.98 5.29 6.34
4775.3 1601.8 2179.2 5302 6436.5 4106.8 12987.4 6016.2 9562.7
2252.2 685 904.2 2062.8 2102.2 1196.1 2608.6 1136.5 1664.1
44783_s_at 216989_at 208855_s_at 200759_x_at 200095_x_at 35201_at 201429_s_at 20845_at 201358_s_at 214041_x_at

Description		Consensus includes ab: Al 133386 (DEE-Homes DNA Consensus includes ab: Al 1333	db:NM 006924.1 /DFE=Home earliester entiring the sequence from clone RP1-181C24 on chromosome 6	db:NM 005931.1 /DEF=Home canions MuC class I action, argumeserine-rich 1 (splicing factor 2, alternate spl	Consensus includes ab: AF161382 4 /heE=Home continue uchoose and consensus includes ab: AF161382 4 /heE=Home continue uchoose and conti	Consensus includes ab: RE440025 /FEA=FET IND VEFF=: 4445040 includes ab: REA=mRNA /PROC	db:NM 001449.1 /DEF=Home canions four and a bale 1 m d mail of virial of vir	gb:NM 006198.1 /DEF=Homo canions Durking Authorotic A (BCDA) (CENT) (FHL1), mRNA, /FEA=mRNA /GEN=FH	db:NM 005410.1 /DEF=Home caniene calemanatelle D. Monte, 4 /Stratt.	gb:NM 007272.1 /DEF=Home sapiens chymotrynein C (caldocin) (CEDC)	gb:NM 007127.1 /DEF=Home sapiens villin 1 (VII 1) mDNA /FEA==BNA /OTNAVIII / (SEC)	gb:NM 004808.1 /DEF=Homo sapiens N-myristoyitransferase 2 (NMT2)	gb:NM 001017.1 /DEF=Homo sapiens ribosomal protein \$43 /DD\$43	Consensus includes ab: BG034239 /FFA=FST /DR XRFF=nt-12/2239 /DB VDFF	gb:U49396.1 /DEF=Human jonotropic ATP recentor Doych monA completed and recent to the completed and th	3b:NM 003756.1 /DEF=Homo saniens entkarvotic translation initiation fortal 2 million for 1 million	Consensus includes ab: Al685944 /FFA=FST /DR XPEE=A: A927229 /DB XPTT	3b:NM 005345.3/DEF=Homo saniens heat shock 70kD protein 44 (USD444)	jb:U43784.1 /DEF=Human mitoden activated protein kinase activated prote	b:NM 016621.1 /DEF=Homo sapiens hypothetical protein (1 OC51247)	Ib:NM 014999.1 /DEF=Homo sapiens KIAA0118 protein (KIAA0140)	ib:NM 006016.1 /DEF=Homo saniens CD164 anticon sistematical (CD464)	Sonsensus Includes ab: AW438464 /FFA=FST /DR XBEE=A: 8072770 /DB VDFT	Ib:NM_003851.1 /DEF=Homo sapiens cellular represent of EAA etimulated from the first of the factor of the first of the factor of	b:NM 002923.1 /DEF=Homo sapiens regulator of Garatein signalling 2 24th (1900)	Onsensus includes ab: AW170359 /FEA=FST /DR XREF=~: 6401994 /DB VRFT	b:NM 005907.1 /DEF=Homo sapiens mannosidase alpha class 14 mannosidase alpha class 14 mannosidase	b:NM 031207.1 /DEF=Homo sanians hymothetical protein utops (11700), month 11 / FEA=m	b:NM 021638.1 /DEF=Homo sanians actin filament associated actoria (Artes)	Onsensus includes ab:Al476267 /FFA=FST /DR_XPFE==:4320242 /DR_XPT===:4320242 /DR_XPT====================================	b:NM 012108.1 /DEF=Homo sapiens RCR downstream standing 4 /DDDC4/	b:NM 014812.1 /DEF=Homo sapiens KIAA0470 gaps product (KIAA0470)	gb:NM_003685.1 /DEF=Homo sapiens KH-type splicing regulatory protein (FUSE binding protein 2) (KHSR
CP4 vs P4	Fold Change	-2.08	-1.79	-1.74	-1.73	-1.72	-1.72	-1.61	-1.6	-1.58	-1.56	-1.56	-1.55	-1.54	-1.52	-1.49	-1.48							-1.42 g	-1.42	-1.41			4.1-	-1.39 C	-1.39 g	-1.39 g	-1.38 g
CP4HX12 P4HX12	Signal	628.6	at 1249 697 -2.08 1149.8 644.7 -1.74 1119.8 644.7 -1.74 1076.1 624.6 -1.73 1076.1 624.6 -1.72 2224.9 1296.5 -1.72 2372.6 1470.7 -1.61 1154 723.3 -1.6 1678.6 1062.2 -1.58 1056.1 676.8 -1.56 1159 741.8 -1.56 1178.3 1200.2 -1.54 1178.3 1200.2 -1.48 1778.3 1200.2 -1.44 1778.3 1200.2 -1.44 1254.8 826.5 -1.47 1778.3 1200.2 -1.44 1778.3 1200.2 -1.44 1778.3 1200.2 -1.44 1778.3 1200.2 -1.44 1778.3 1200.2 -1.44 1778.3 1200.2 -1.44 181.7 805.5 -1.47 1778.3 1200.2 -1.44 1087.8 776.4 -1.4 1087.8 776.4 -1.4 1179.2 915 -1.4 1187.8 692.8 -1.39 910.6 656.2 -1.39 959.6 692.8 -1.39																														
CP4HX1	Signal	1308.1	1249	1119.8	1537.9	1076.1	2224.9	2372.6	1154	1678.6	1056.1	1159	8197	1480.6	1254.8	1686.1	206	1778.3	1181.7	1275.2	1299.4 -	2947.3	993.6	1078.7	1118.4	1191	1066.9	1087.8	1279.2	835	910.6	926.6	1119.3
	Probe set	205430_at	201742_x_at	206247_at	213031_s_at	214321_at	201540_at	205549_at	201427_s_at	206297_at	205506_at	205006_s_at	200018_at	213513_x_at	210448_s_at	201592_at	213878_at	200799_at	202787_s_at	203278_s_at	203885_at	208405_s_at	215203_at	201200_at	202388_at	213319_s_at	208116_s_at	221435_x_at	203563_at	204234 s_at	220059_at	207719_x_at	204372_s_at

Consensus includes gb::AF191664.2 IDEF=Homo sapiens diphosphoinositol polyphosphate phosphohydr gb::U90940.1 IDEF=Homo sapiens cell-type natural killer cells Fc gamma receptor III.3 (Fc-gammaRIC) mR gb::NM_018307.1 IDEF=Homo sapiens bypothetical protein FLJ.11409 (FLJ.11404), mRNA. FEA=mRNA /GER gb::NM_018307.1 IDEF=Homo sapiens hypothetical protein FLJ.12895 (FLJ.12895), mRNA. FEA=mRNA /GER gb::NM_023926.1 IDEF=Homo sapiens typothetical protein FLJ.12895 (FLJ.12895), mRNA. FEA=mRNA /GER gb::NM_000550.1 IDEF=Homo sapiens typothetical protein FLJ.12895 (FLJ.12895), mRNA. FEA=mRNA /GEN=TY Gonsensus includes gb::BE66511 FEA=EST /DB_XREF=gi:10415287 /DB_XREF=est:6016788857 (ICLONE=MG) (A1412.1 IDEF=Homo sapiens the control of the contr	gb:NM_007066.1 /DEF=Homo sapiens tetraspan 1M4SF (TSPAN-6) mRNA, complete cds. /FEA=mRNA /GEN gb:NM_007066.1 /DEF=Homo sapiens protein kinase (cAMP-dependent, catalytic) inhibitor gamma (PKIG) Consensus Includes gb:N64802 /FEA=EST /DB_XREF=gi:1212631 /DB_XREF=est:yz31b05.s1 /CLONE=IMA gb:NM_003339.1 /DEF=Homo sapiens ubiquitin-conjugating enzyme E2D 2 (homologous to yeast UBC45) gb:NM_016146.1 /DEF=Homo sapiens PTD009 protein (PTD009), mRNA. /FEA=mRNA /GEN=PTD009 /PROD gb:NM_004108.1 /DEF=Homo sapiens ficolin (collagenfibrinogen domain-containing lectin) 2 (hucolin) (FC
1.38 1.37 1.37 1.35 1.35 1.35 1.33 1.33 1.33 1.33 1.32 1.32 1.28 1.28 1.28 1.28 1.26	1.26 1.25 1.25 1.25 1.25
1650.7 759.1 795.2 820.9 1058.5 1285 6373.5 643.3 873.3 1396.1 813.7 3206.2 872.4 1039.7 1569 902.9 802.7 3453.3 980.1 1195 758.1 1195 758.1	1241.8 1008.1 1033.1 1053.4 1144.2
2279.7 1040 1087.6 1124.2 1448.4 1752.5 8659.9 866.4 1181.2 1181.2 1172.2 1172.2 1172.2 1172.2 1172.2 1182.9 1045.1 4498.4 1508.6 1531.3 959.7 1331.4 1646.6 866.4	1565.6 1259.4 1290 1316 1429.3
212181_s_at 211395_x_at 218323_at 206833_s_at 206833_s_at 208942_s_at 205694_at 205694_at 212149_at 44563_at 212149_at 44563_at 20275_s_at 203455_s_at 203455_s_at 203455_s_at 203455_s_at 20148_at 20158_at 20178_at 20178_at 20178_at 20178_at 20178_at 20178_at 20178_at 20178_at 20178_at 20178_at 20178_at 20178_at 20178_at 20178_at 20178_at 20178_at 20178_s_at	202732_at 213064_at 201345_s_at 217958_at 207804_s_at

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704.8 1322.2 1330.1 2634.1 833.3 1251.9 1491.4 4906.6 1084.3 939.1 975.3 1701.2 1087.8 2696.4 944.3 978.7 1542.4 1558.5 728.4 933.2 1008.3 1184.7 1198.1 1218.8	795.9 879.2 914.2 974.8
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1763.9	2152.7	2734.2	1396	1693.9	1826.3	2185.9	1088.7	1436.5	1491.9	1812.5	2282	2766	961.3	1082.6	1674.6	1861.3	949.3	995.7	1225.3	1247.5	1448.6	909.2	976.2	1010.6	1082.9	1,77,17	1255.9	1,202.T	924.8	966.8	1129.6	1232.1	1240.6	1483.2	
1445.7	1771.3	2240	1138.4	1381.1	1481.5	1771	876.9	1161.4	1202.9	1456.4	1847	2233.8	766.9	862.9	1342.8	1483.8	753.7	9.067	971.7	988.9	1149.4	717.2	767.1	7.27	850.7	928.6	987.9	995.1	722	757.5	881	963.2	969.3	1161.5	
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1625.4 2494 897.4 990.5 1078.1 1254.1 1288 1333.5 1433.5 2251.4 2544.2 874.4 958.3 1017.9 1120.9 1474.8 2598.8 5746.1 1087.4 1126.7 1126.7 1126.7 1126.7 1126.7 1130.8	1739.3 1739.3 1050.4 1183.4 1274.8 1331.2 846.9 878.3
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1009.9 1421.5 780 1203.1 1203.1 1308 1884.5 2328 1038.7 1125 1139.7 1711.4 2094.3 2332.8 918.9 1294.2 1378.2 1378.2 1378.2 1378.2 1378.2 1380.1 6143.6 905.7 1031.5 1129.6 1129.6 1129.6 1150.7 1150.7 1150.7 1150.7 1150.7 1150.7 1150.7 1150.7 1150.7 1150.7 1150.7 1150.7 1150.7 1150.7 1150.7 1150.7
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4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	1.47
1212.5 1323.2 1508.7 1729.4 1729.4 1729.4 1124.8 1126 1134.2 969.5 1004.6 1638.6 1658.7 1658.7 1658.7 1670.4 120.5 1940.3 2397.6 3279 970.2 1450.4 195.8 1995.8 1995.8	912.6
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1205 1315.1 1435.6 1752.8 1821.1 3657.2 1273.6 1472.9 1793.5 1827.5 882.3 1109.9 2043.5 4029.9 1080.4 1364.7 1442.2 1687.5 2219.6 936 1267.7 1341.4 1018.2 1336.7 1346.1 1341.4 1018.2 1336.7 1346.7 1347.9 1347.9 1347.9 1347.9 1347.9 1347.9 1347.9 1347.9 1347.9 1347.9 1347.9 1347.9 1347.9 1347.9 1347.9
821.4 897 976.5 1192.4 1237.8 2495.1 860.4 929.5 995.2 1213.3 1241.7 555 722.4 907.1 941.3 1121.9 1476.4 617.9 837.1 890 668.4 877.6 951.6 1002.7 1289.6 1939.2 670.4 855.2
213960_at 200738_s_at 36888_at 203752_s_at 214211_at 204007_x_at 203725_at 203725_at 203725_at 203725_at 21095_s_at 219454_at 219454_at 21149_at 21149_at 211206_at 211207_s_at 212006_at 21149_at 211207_s_at 201006_at 212006_at 21364_s_at 201012_at 202029_x_at 202029_x_at 21366_s_at 21360_at 21360_at 201012_at 20101

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933 1265.2 1823.4 2022.2 1287 1568 13018 1436.2 2597.9 2663.8 2766.1 1622.2 1622.2 1696.4 3509.5 887.6 1239.3 1482.8 1756.5 1127.6 1438.1 2026.2 1292.2 2026.2 1292.2 2026.2 1295.9 967.9
605.8 820.2 11184.2 1312.1 829.2 1012.7 8390.7 713 923.2 1668.1 1021.4 1151.5 1207.9 590 1057.1 2196.1 551.4 770.3 922.6 947.8 1306.8 243.8 1103.4 1237.2 761.1 887.8
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800 1040.3 687.8 883.1 1818.7 989.6 2844.6	609.4 859.7 1151.7 1022.8 813.6	10/1,4 937 1089,2 1162,8 1060,9 1388,4	1607.4 939.3 1034 1401.8 470.8 796.9 1284.6 796.2 1309 521.8 812.3 826.1	3/2.6 1121.2 862.9
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2.28 2.29 2.29 2.33 2.33 2.34 2.35 2.36 2.58 2.74 2.69 2.95 3.07	3.22 3.28 4.02 4.86					
1721.3 9942.1 1273.9 1484.2 1540 1867.3 2042 13418.7 1516.9 3121 1916.6 4643.6 1487.2 4005.2 1779.6 4862.3 3817.8 4954	4524.6 2311.5 4628 11218.4					
754.9 4353.8 555.9 648.1 659.8 800 875.1 5728.7 5712.9 635.9 1221.2 743.2 1786.9 553.2 1668.9 1293 1612.2 855.9	1404.5 704 1150 2308.6 2098.5					
204108_at 207783_x_at 204651_at 213477_x_at 213477_x_at 205061_s_at 217975_at 203282_at 203282_at 208825_x_at 208825_x_at 208825_x_at 201301_s_at 201257_x_at 221619_s_at 221474_at 221478_s_at 221474_at 221478_s_at 2214938_x_at 214938_x_at 214938_x_at 214938_x_at	201631_s_at 211185_s_at 204748_at 205207_at 211943_x_at					